G.C.E. (A/L) Student Support Seminar - 2013
Revision Paper

Chemistry **I** **Time 2 hours**

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* Answer all questions.
* Use of calculators is prohibited.
* Write your Index Number in the space provided.
* Read carefully' the instructions given on the reverse side of the answer sheet.
*For questions 1 to 50 ,select the correct or the most appropriate answer from the options 1 , 2, 3, 4 or 5, and mark it using a cross (x), following instructions given on the reverse side of the answer sheet.

Universal gas constant $R = 8.314\ J\ K^{-1}\ mol^{-1}$

Avagardro's Constant $N_A = 6.022\times10^{23}\ mol^{-1}$

Planks' constant $= 6.626\times10^{-34}\ J\ s$

Velocity of light $= 3\times10^{8}\ m\ s^{-1}$

1. In which species below, contains the same number of electrons ,as in an α particle?
(1) H (2)He (3) H^+ (4) H_2 (5) Li^+

2. In which molecule , given below ,that the atoms are not in the same plane?
(1) Bensine (2) Boron trichloride
(3) Iodine trifluoride (4) Methanal
(5) Propene

3. What is the non -polar molecule given below?
(1) C_2F_4 (2) CF_2Cl_2 (3) $CHCl_3$ (4) CH_3Cl (5) NF_3

4. W g of an organic compouund was vapourized and introduced into a syringe.The volume was V cm^3 of that vapour, when the pressure was P Nm^{-2} and temperature was T K. The relative molar mass of that compond is ,

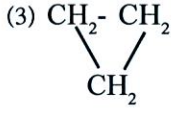
(1) $\frac{W\times22400\times10^5\times T}{273\times P\times V}$ (2) $\frac{(W\times22400)+(T+273)}{P\times V\times10^{-3}}$ (3) $\frac{W\times22.4\times10^5\times T}{P\times V}$

(4) $\frac{W\times22400\times T}{P\times V\times273}$ (5) $\frac{W\times22400\times273\times P}{V(T+273)}$

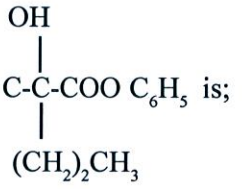
5. Electronegativity of five elements Q,R,T,X, and Z are 0.7, 1.0, 1.5, 2.5 and 4.0 respectively . Which is the bond below, that shows ionic properties mostly?

(1) Q-R (2) Q-T (3) R-T (4) T-X (5) Q-Z

6. The amount of hydrogen in a gaseous hydrocarbon is 17.25% by mass. The volume of 0.029 g of that gas at S.T.P.is 11.20 cm^3 . The Structural formula that could be drawn for that hydrocabon is ,

(1) $CH_3CH_2CH_3$ (2) $CH_3CH = CHCH_3$ (3) 

(4) $CH_3\text{-}CH(OH)\text{-}CH_3$ (5) $CH_3\text{-}CH_3$

7. The IUPAC name of the organic compond  is;

(1) phenyl 2-hydroxy-2-propyl-3-pentyneoate
(2) phenyl 2-hydroxo-2-propylpent-3-yneoate
(3) Phenyl 2-hydroxy-2-propylpent-3-ynoate
(4) Phenyl 2-hydroxo-2-propyl-3-pentynoate
(5) phenyl 2-hydroxy-2-propenylpentanoate

8. What is the compound below ,that is formed when ammonia and carbondioxide are heated under a certain pressure?

(1) NH_4HCO_3 (2) $(NH_4)_2CO_3$ (3) NH_2COONH_4
(4) $(NH_4)_2CO$ (5) NH_4COONH_4

9. The density of Ne gas is maximum at,

(1) 0^0C and 1×10^5 Pa
(2) 0^0C and 2×10^5 Pa
(3) 273^0C and 1×10^5 Pa .
(4) 273^0C and 2×10^5 Pa .
(5) 278 K and 1×10^5 Pa .

10. 50 cm^3 of weak monobasic acid, concentration of which was z $moldm^{-3}$,was shaken well with 100 cm^3 of $CHCl_3$ 100 cm^3 at 30^0C and kept aside to stabilize .The coefficient of disperson of the compound which is more soluble in water than in $CHCl_3$ is 10 at 30^0C.If the concentrations of the substance in aqueous phase and in $CHCl_3$ are y $moldm^{-3}$ and x $moldm^{-3}$ respectively, what is the expression for x in terms of z and y?

(1) $x=\frac{z-y}{2}$ (2) $x=(z-y)2$ (3) $x=\frac{z}{2}-y$ (4) $x=\frac{y}{2}-z$ (5) $x=\frac{z-y}{4}$

11. The expression which is true for the reaction between the compound $(CH_3)_2CHCHO$ and an aqueous solution of Na_2CO_3 is ,

(1) An aldehyde is formed as the main product by nucleophilic substitution.
(2) An aldehyde is formed as the main product by nucleophilic addition
(3) An alcohol and an aldehyde are formed as main products by nucleophilic substitution
(4) A mixture of an alcohol and an aldehyde is formed by nucleophilic addtion.
(5) A mixture of an aldehyde and a salt of carboxilic acid is formed by nucleophilic addition

12. This question is based on following organic compounds containng nitrogen

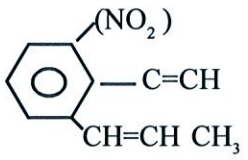
(a) $C_6H_5NH(CH_3)$
(b) $C_6H_5CONH_2$
(c) $C_6H_5CONH(CH_3)$
(d) $C_6H_5NHC_6H_5$

The ascending order of basicity of those componds is,

(1) c < b < a < d (2) b < a < c< d (3) b < c < a <d
(4) b < c < d < a (5) a < b < c < d

13. Number of atoms subjected to sp^2 hybridization and the number of hydrogen atoms in same plane of organic compound given below are respectively.

(1) 9,7 (2) 8,7 (3) 8,6 (4) 7,6 (5) 6,5



14. The number of isomeric forms that can be drown for the molecular formula C_3H_5Br is;

(1) 3 (2) 4 (3) 5 (4) 6 (5) 7

15. The product/s that can be obtained when N_2O_4 gas bubbled through an aqueous solution of KOH is/are;

(1) KNO_3 (2) KNO_2 (3) K_3N and KNO_2

(4) $NH_4NO_2$and NO_2 (5)KNO_3 and KNO_2

16. The substances that are introduced into the blast furnace in the extraction of iron are;

(1) FeO, lime stone and coke (2) Fe_2O_3, quicklime and coke

(3) Fe_2O_3, lime stone and coke (4) Fe_3O_4, slaked lime and coke

(5) FeO, CaO and coke

17. what is the set of gases below, that contributes most for acid rains?

(1) NO_2, SO_2, SO_3 (2) NO, CO_2, HC1

(3) NO_2, H_2S, CO_2 (4) SO_2, SO_3, CO_2

(5) NO, CO, SO_2

18. 50 cm^3 of NH_4OH ,concentration of which is 0.1 $moldm^{-3}$ were added to 25 cm^3 of HCl, concentration of which is 0.1mol dm^{-3} at 25°C. (Kb of $NH_4OH = 1\times10^{-5}$ mol dm^{-3})

pH of this solution is,

(1) 5 (2) 7 (3) 9.24 (4) 1 (5) 9

19. The most suitable sequential order to carry out the following reaction is;

(1) CH_3Cl with anhydrous $AlCl_3$, $CH_3(CH_2)_3Cl$ with anhydrous $AlCl_3$

(2) $CH_3(CH_2)_3Cl$ with anhydrous $AlCl_3$, CH_3Cl with anhydrous $AlCl_3$

(3) $CH_3(CH_2)_2COCl$ with anhydrous $AlCl_3$, CH_3Cl, with anhydrous $AlCl_3$,conc.HCl with Zn/ Hg

(4) CH_3Cl with anhydrous $AlCl_3$, $CH_3(CH_2)_2COCl$ with anhydrous $AlCl_3$, conc.HCl with Zn/ Hg

(5) $CH_3(CH_2)_2COCl$ with anhydrous $AlCl_3$, Fe and Cl_2, Zn/Hg and conc.HCl / CH_3MgCl

20. A sample of urine containing 1.2g of urea (NH_2CONH_2) was treated with excess HNO_2 solution in a medical laboratory.The reaction is given below.

$$NH_2CONH_2 + 2HNO_2 \longrightarrow CO_2 + 2N_2 + 3H_2O$$

mixture of gases obtained at the end of reaction was sent through aqueous solution of NaOH.

What could be the volume of gas obtained at the end?

(C=12, H=1,N=14, Molar volume of a gas at room temperature and pressure is 24 dm^3.)

(1) 9.6 dm^3 (2) 14.4 dm^3 (3) 48.0 dm^3 (4) 0.96 dm^3 (5) 24.0 dm^3

21. What is the activity below ,by which the electro-motive force of a lead acid accumulator could be increased?

(1) Increasing the concentration of sulphuric acid (2) Using large lead plates

(3) Adding excess amount of water (4) Using small lead plates (5)

(5) Adding diluted HCl solution

22. what is the reaction that can take place, out of the reactions of halogenated hydrocarbons given below?

(1) $C_2H_5Br + NH_3 \rightarrow (CH_3)_2NH$
(2) $C_6H_5Br + NH_3 \rightarrow (C_6H_5)_3N$
(3) $C_6H_5Br + CH_3MgBr \rightarrow C_6H_5CH_3$
(4) $CH_3Br + C_6H_5NH_2 \rightarrow C_6H_5N(CH_3)_3Br$
(5) $CH_3Br + HC\equiv CMgBr \rightarrow C_3H_4$

23. $CaSO_4(s)$ was added to a solution of 0.01 mol dm^{-3} H_2SO_4 and was shaken well. What is true about this solution?

(Ksp $CaSO_4 = 1.95\times10^{-4} mol^{-2} dm^{-6}$ at the relevant temparature.

(1) $[SO_4^{2-}(aq)] = 0.01$ mol dm^{-3}
(2) $[Ca^{2+}(aq)] = 1.95\times10^{-3}$ mol dm^{-3}
(3) Solubility of $CaSO_4$ in $H_2SO_4 = 9.9\times10^{-4}$ mol dm^{-3}
(4) $[Ca^{2+}(aq)] = 1.95\times10^{-2}$ mol dm^{-3}
(5) $[SO_4^{2-}(aq)] = 1.95\times10$ mol dm^{-3}

24. 25 cm^3 of a solution, concentrations of which was 0.1 mol dm^{-3} in relation to a strong mono-basic acid and 0.1 mol dm^{-3} in relation to weak mono-basic acid was titrated with a solution of Na_2CO_3 using,

(1) methyl orange indicator
(2) phenolphthalein indicator

What was the volume of the base used, respectively

(1) 12.5 cm^3 and 25 cm^3 (2) 12.5 cm^3 and 12.5 cm^3
(3) 25 cm^3 and 25 cm^3 (4) 25 cm^3 and 50 cm^3
(5) 12.5 cm^3 and 50 cm^3

25 50 cm^3 of H_2O_2 solution, acidified with dil H_2SO_4 was reacted with excess amount of KI solution. 20.00cm^3 of 0.01 mol dm^{-3} $Na_2S_2O_3$ solution was necessary to react completely with I_2 liberated in the above reaction. What was the concentration of H_2O_2 solution in moldm^{-3}

(1) 0.002 mol dm^{-3} (2) 0.2 mol dm^{-3} (3) 0.02 mol dm^{-3}
(4) 0.068 mol dm^{-3} (5) 2.00 mol dm^{-3}

26. What is the correct statement given below?

(1) Reaction rate increases with the increase of temperature for all chemical reactions.
(2) Reaction rate decreases with the increase of temperature only for exothermic reactions
(3) Reaction rate increases,with the increase of temperature,only for endothermic reactions.
(4) Heating of the reactants of an exothermic reactions causes thesystem to achieve equilibrium
(5) Exothermic reactions only,occur spontaneously in room temperature

27. 1 mol of the compound $[Cr(NH_3)_4Br_2]Cl$ was dissolved in water and an excess amount of $AgNO_3$ solution was added. Which of the following will happen?

(1) Clear solution will obtain
(2) $[Cr(NH_3)_4Br_2]NO_3$ 1 mole will be obtained as the product
(3) AgCl 1 mole will be precipitated
(4) AgBr 2 mole will be precipitated
(5) Three moles of silver halide will be precipitated

28. Reaction between $PH_3(g)$ and $HI(g)$ is given below.
$PH_3(g) + HI(g) \rightarrow PH_4I(s)$ $\Delta H = -101.8$ kJ mol^{-1}
Standard enthalpy values of heat of formation of $PH_3(g)$ and $HI(g)$ are +5.4 kJ mol^{-1} and +26.5 kJ mol^{-1} respectively. what is the standard enthalpy of formation of PH_4I ?

(1) -133.7 kJ mol^{-1} (2) -69.9 kJ mol^{-1} (3) +69.9 kJ mol^{-1}
(4) +133.7 kJ mol^{-1} (5) -122.9 kJ mol

29. Temperature of N_2 gas which has the avarage speed of He gas at temperature 300 K is , (He =4 N=14)

(1) 2100 K (2) 1100 K (3) 420 K
(4) 1200 K (5) 4200 K

30. Solubility of CO_2 in Sea water can be increased by ;

(1) Applying high pressures and high temperatures.
(2) Applying low pressures and low temperatures
(3) Appling high temperatures and low pressures
(4) Using acidic medium
(5) Using basic medium

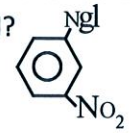
[1] One or more of the responses (a),(b),(c), and (d) given for question number 31 to 40 is/are correct. Select the correct response/s.

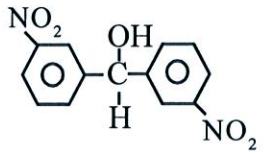
if only (a) and (*b*) are correct, mark on (1)
If only (b) and((c) are correct ,mark on (2)
If only (c) and (d) are correct ,mark on (3)
If only (d) and (e) are correct ,mark on (4)
If any other combination is correct , mark on (5)

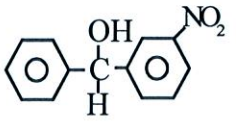
Summary of directions

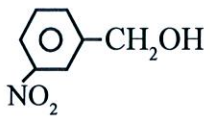
1	2	3	4	5
Only (a) and (b) are correct	Only (b) and (c) are correct	Only (c) and (d) are correct	Only (d) and (e) are correct	**Any other response or combination of responses**

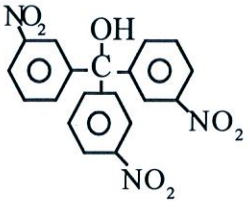
31. What is/ are the product/s when a mixture of benzaldehyde and formaldehyde is reacted with in appropriate condition and hydrolyzed?



(a) 

(b) 

(c) 

(d) 

32. A solid sample of the alum $(NH_4)_2SO_4.Al_2(SO_4)_3.24H_2O$ was dissolved in distilled water and the solution was prepared to a volume of 1 dm^3.If there were 0.2 moles of Al^{3+} ions in that solution, what is the correct statement given below?

(a) The concentration of SO_4^{-2} in 0.4 mol dm^{-3}

(b) The concentration of all the ions is 0.8 mol dm^{-3}.

(c) The concentration of cations is 4.0 mol dm^{-3}.

(d) The amount of O_2 molecules in anions is $0.8x6.022x10^{23}$

33. hexaaquairon (III) ion hydrolyses as shown below.

$[Fe(H_2O_6)]^{3+}_{(aq)} + H_2O_{(l)} \quad [Fe(H_2O)_5OH]^{2+}_{(aq)} + H_3O^+_{(aq)}$

The correct statement about the above balanced reaction is;

(a) Above hydrolysis occurs well in low pH conditions

(b) Oxidation number of Fe is reduced during the reaction

(c) Hydrolyzing process of $[Fe(H_2O_6)]^{2+}_{(aq)}$ is less than the that of $[Fe(H_2O_6)]^{3+}_{(aq)}$ comparatively

(d)When NaOH is added gradually into the above system in equilibrium , pH valuve of the medium increases.

34. What is/are the correct statements below?

(a) Anode is not oxidized at any time in electrolysis.

(b) Anode is always the negative terminal of an electro-chemical cell.

(c) Balanced reactions do not occur on electrodes in electrolysis

(d)There is no potential to the hydrogen electrode

35. What is/are the group/s of compounds below, that does/do not contain a green house gas?

(a) SO_2, O_2 (b) N_2O, O_3

(c) CH_4, H_2O (d) H_2O, F_2O

36. The rate equation for the reaction;

$I^- + CH_3Cl \rightarrow CH_3I + Cl^-$ is given below.

$R = K[I^-]\ [CH_3Cl]$ Here R is the rate.

Which statements below are correct.

(a) This is a second order reaction

(b) This is a first order reaction in relation to I^- and CH_3Cl.

(c) Rate of reaction increases when excess amount of KI is added.

(d) Rate of reaction decreases when excess amount of KCl is added.

37. What is/are the correct statement/s below?

(a) The volume of 1 mol of any perfect gas is equal at the same temperature and pressare

(b) The density of a perfect gas under constant pressure is inversely proportional to its temperature

(c) The volume of a given mass of a perfect gas, under constant pressure, doubles when it's temperature is increased from 25°C to 50°C

(d) When the temperature of a gas is increased, molecular fraction that reaches its highest probable speed decreases gradually.

38. What is/are the correct statement/s below,on rusting of iron?

(a) Rusting decreases when soap is dissolved in water

(b) Rusting decreases when NaCl is dissolved in water.

(c) Rusting decreases when NH_4Cl is dissolved in water.

(d) Rusting decreases when $NaHCO_3$ is dissolved in water.

39. When a mixture of CH_3COOH and $CH_3COOC_2H_5$ is heated with concentrated ammonia,

(a) $C_2H_5CONH_2$ is obtained as the main product .

(b) CH_3CONH_2 is obtained as the main product.

(c) CH_3COONH_4 could be obtained as a product.

(d) $C_2H_5NH_2$ could be obtained as a product.

40. Aqueous NH_4Br solution can react with,

(a) Na_2CO_3 (b) Conc. HCl

(c) Dil NaOH (d) Aqueous K_2CrO_4

- Two statements are given for each question from number 41 to 50. Select the most suitable response from (1),(2),(3),(4) and (5) of the table given below and mark apprriately on your answer script.

Responce	Frist statement	Second Statement
(1)	True	True and clarifies the first statement correctly
(2)	True'	True but does not clarify the first statement correctly.
(3)	True'	False
(4)	False	True.
(5)	False	False

	Frist statement	Second Statement
41.	The pressure of a sample of perfect gas under constant temperature was increased from 1.5×10^6 Pa to 6.0×10^6 Pa. Then its volume dropped down from 76.0 cm^3 to 20.5cm^3 .	When the temperature is constant ,the pressurs of a gas is inversely propotional to its volume.
42.	The rate of the reaction $H_2(g)+I_2(g) \rightarrow 2HI(g)$ at constant temperarure can not be increased by increasing the partial pressures of $H_2(g) + I_2(g)$	According to the kinetic molecules theory of gases, the speed of the molecular of a perfect gas does not increase, when the pressure is increased at constant temperature
43.	3-nitro derivative could be obtained by the nitration of $C_6H_5N_2HSO_4$	Cation $C_6H_5N_2^+$ deactivates the benzene ring
44.	Process of cement production contributes considerably to the green house effect	CO_2 gas liberated to the environment in cement production
45.	HCl has the minimum boiling point among the compounds HF,HCl, HBr and HI	Hydrogen bond between H-Cl is weaker than that between H-F
46.	Iodine can be prepared by reacting solid sodium iodide with concentrated sulphuric acid	Iodine is a good oxidizer
47.	HCHO and HCOOH can be differentiated by using Fehling solution	Any aldehyde convertes Cu^{2+}ions to Cu_2O in a basic medium.
48.	Tefflon is not a thermostable polymer	There are no condensed linear chains in tefflon
49.	Oxygen reacts with hydrogen easily in room temperature than chlorine does.	Oxegen is a more electronegative element than chlorine.
50.	Trioxygen does not act as a polluting agent in lower atmosphere.	Trioxygen does not act as an oxydizer in lower atmosphere.